LISTING OF CLAIMS

WHAT IS CLAIMED IS:

1 (ORIGINAL). A system for analyzing a surface condition of a printed circuit board (PCB) using RGB colors, comprising:

feeding means for feeding a target PCB, to be measured, to an image pick-up position where pick-up means is disposed;

the pick-up means for picking up an image of a metal surface of the target PCB fed by the feeding means, and externally transmitting data of the picked-up image; and

signal analyzing means for setting relative RGB values derived through a moisture absorption test carried out for a comparative PCB at intervals of time, extracting pixel data from the picked-up image of the target PCB received from the pick-up means, performing a mapping operation for RGB signals of the extracted pixel data, thereby determining relative RGB values, and comparing the determined relative RGB values with the relative RGB values derived through the moisture absorption test, thereby producing cumulative distribution data of the relative RGB values for the target PCB.

2 (ORIGINAL). The system according to claim 1, wherein the pick-up means comprises a digital camera, a scanner, or a charge coupled device.

3 (ORIGINAL). The system according to claim 1, wherein the signal analyzing

means comprises:

a data transmitting/receiving unit for receiving the picked-up image data from the pick-up means, and outputting the cumulative distribution data of the relative RGB values for the target PCB produced in accordance with the RGB-mapping operation;

a light source setting unit for setting a color temperature and brightness of light to be used upon picking up the image of the target PCB;

an RGB range setting unit for setting RGB ranges to be applied to a mapping operation to be carried out for the picked-up image of the target PCB in the unit of pixels in accordance with a mapping program;

a database for storing the set relative RGB values representing the oxidation degree of the comparative PCB subjected to the moisture absorption test;

a signal converting unit for converting the relative RGB values derived for the target PCB into an electrical signal; and

a signal processing unit for transmitting a light source setting control signal, an RGB range setting control signal, a control signal adapted to control an operation of the feeding means, and an image pick-up control signal to the light source setting unit, the RGB range setting unit, the feeding unit, and the pick-up means, respectively, receiving the picked-up image data inputted through the data transmitting/receiving unit, extracting pixel data from the received picked-up image data for a selected pixel, performing an RGB mapping operation for the extracted pixel data, and determining relative RGB values from the RGB-mapped pixel data, thereby producing cumulative distribution data.

4 (ORIGINAL). The system according to any one of claims 1 to 3, wherein the RGB signals only have R signal components.

5 (ORIGINAL). The system according to claim 1, wherein the feeding means comprises:

a conveyor belt connected to a production line for PCBs, and adapted to feed a PCB from the production line to the image pick-up position;

a sensor installed at a predetermined position on the conveyor belt, and adapted to sense an operating state of the conveyor;

a control signal input/output unit for receiving, from the sensor, a sensing signal representing the sensed operating state of the conveyer, and transmitting the sensing signal to the signal analyzing means, the control signal input/output unit also receiving, from the signal analyzing means, a control signal adapted to control an operation of the feeding means; and

a control unit for controlling the operation of the feeding means, based on the control signal.

6 (CANCELLED).

7 (CURRENTLY AMENDED). [[The method according to claim 6]] A method for analyzing a surface condition of a printed circuit board (PCB) using RGB colors, comprising the steps of:

(A) setting relative RGB values for PCBs, and storing the set relative RGB values;

(B) picking up an image of a target PCB, to be measured, fed by a feeding unit;

(C) performing an RGB-mapping process for pixel data extracted from the picked-up image of the target PCB; and

(D) producing accumulative distribution data of relative RGB values for the pixel data of the target PCB, thereby quantitatively determining an oxidation degree of the target PCB, wherein the step (A) comprises the steps of

performing a moisture absorption test for a metal surface of a PCB under a predetermined condition;

measuring values of RGB signals detected from the PCB with the lapse of time after the moisture absorption test;

dividing each of the measured RGB signal values by a corresponding RGB signal value obtained for a PCB not subjected to the moisture absorption test, thereby measuring relative RGB values; and

storing the relative RGB values in the database to use the stored relative RGB values as comparative data for measuring the oxidation degree of the target PCB.

8 (CURRENTLY AMENDED). The method according to claim [[6]] 7, wherein the step (B) comprises the steps of:

feeding the target PCB to an image pick-up position where a pick-up unit is disposed, in accordance with a feeding operation of the feeding unit;

determining whether or not a color temperature and brightness of light to be irradiated onto the target PCB upon picking up an image of the target PCB are set to predetermined values, respectively;

if the color temperature and brightness of the light are not set to the predetermined values, respectively, sending a control signal, adapted to set the color temperature and brightness of the light to the predetermined values, from a signal analyzing unit to a light source setting unit;

sending an image pick-up control signal, adapted to pick up an image of the PCB, from the signal analyzing unit to the pick-up unit; and

picking up an image of a metal surface of the PCB in accordance with the image pick-up control signal, dividing the picked-up image into pixels of a corresponding bitmap, and producing an image data file of the bitmap.

9 (CURRENTLY AMENDED). The method according to claim [[6]] 7, wherein the step (C) comprises the steps of:

receiving the picked-up image data of the PCB from the pick-up unit via a communication interface by the signal analyzing unit;

running a mapping program by the signal analyzing unit, thereby extracting pixel data from the picked-up image data of the PCB for a selected pixel;

determining whether or not reliable RGB signals are detected from the pixel data extracted by the signal analyzing unit;

if reliable RGB signals are not detected from the extracted pixel data, repeating the pixel data extraction step and the determination step until reliable RGB signals are detected;

determining whether or not optimum RGB ranges for mapping of the pixel data have been set by the signal analyzing unit;

if the optimum RGB ranges for mapping of the pixel data have not been set,

sending a control signal, adapted to set the optimum RGB ranges for the mapping of the pixel data, from the signal analyzing unit to the RGB range setting unit, thereby setting the optimum RGB ranges; and

running the mapping program by the signal analyzing unit, thereby RGB-mapping the pixel data of the PCB.

10 (CURRENTLY AMENDED). The method according to claim [[6]] 7, wherein the step (D) comprises the steps of:

running a mapping program by the signal analyzing unit, thereby extracting RGB signals from the pixel data of thS:\zoya\Resp.2007\4611-29.doce target PCB;

running the mapping program by the signal analyzing unit, thereby determining a relative RGB value from the extracted RGB signals;

comparing the determined relative RGB value with a corresponding relative RGB value searched for from a database stored with relative RGB values, and converting the determined relative RGB value into an electrical signal; and

running the mapping program by the signal analyzing unit, thereby producing cumulative distribution data of relative RGB values of pixel data for the target PCB, and quantitatively determining an oxidation degree of the target PCB exhibited with the lapse of time, based on the cumulative distribution data.